Original Article

Rising trends of syphilis in a tertiary care center in North India

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Abstract

Background and Objectives: Syphilis is a classical sexually transmitted disease (STD), caused by *Treponema pallidum* subsp. *pallidum*. In this retrospective study, we analyzed trends of syphilis prevalence in patient groups attending our tertiary care center. **Materials and Methods:** The data was obtained by reviewing laboratory records of the STD laboratory from January 1, 2006 to December 31, 2011. Cases positive by both Venereal Disease Research Laboratory (VDRL) and *Treponema pallidum* particle agglutination (TPPA) tests were analyzed for seroprevalence of syphilis in different groups, and to analyze the rising or falling trends, if any. **Results:** A total of 28,920 serum samples were received in the 6-year study period for VDRL testing, of which 972 (3.4%) were found to be reactive. Of these, 1722 sera were also submitted for TPPA testing, 374 (21.7%) of which were positive. A total of 375 samples were submitted for both tests, indicating biological false positivity of 0.27%. A rising trend, though not statistically significant, was observed in pregnant women, drug users and patients from wards/out-patient departments, while a statistically significant rise in prevalence of syphilis was found in HIV-positive individuals. A falling trend (not statistically significant) was observed in STD clinic attendees. **Conclusion:** An increasing trend of syphilis was observed during the study period when all groups were analyzed together, especially in HIV-seropositive individuals, which calls for continued and sustained efforts for case detection, treatment, and preventive measures to contain the disease.

Key words: Epidemiology, India, seroprevalence, syphilis, trends

INTRODUCTION

An increase in the prevalence of syphilis has been documented in the United Kingdom (UK), United Sates of America (USA), and India.[1-3] The exact prevalence of syphilis in India is not known because of several reasons viz. the stigma attached to the sexually transmitted diseases (STDs), poor attendance at STD clinics, lack of common registry for reporting STDs, and syndromic management which misses many asymptomatic cases.[4] Hence, most of the studies from India involve only one group of patients and may not be representative of the true situation in the community. Although a previous report from our center indicated a falling trend of syphilis in pregnant ladies, data regarding the prevalence in other groups is lacking.[5] Hence, this study was carried out to analyze the trends of seroprevalence of syphilis in pregnant ladies, drug addicts attending de-addiction clinic (intravenous drug user [IVDU]), HIV-positive patients attending antiretroviral treatment (ART) clinic, patients attending STD clinic and patients admitted in wards/out-patient departments (OPDs), at our tertiary care center in

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North India, from January 1, 2006 to December 31, 2011.

MATERIALS AND METHODS

In this retrospective study, data from laboratory records of samples received from patients at high risk for syphilis/with clinical suspicion of syphilis/as a part of routine screening for HIV seropositive patients attending ART center, drug abusers (IVDU) attending de-addiction center, STD clinic attendees without HIV, and patients from other wards or OPDs, pregnant women attending antenatal clinic or admitted to various wards of our tertiary care center over a period of 6 years, were obtained for the analysis. The patients were categorized into different groups on the basis of clinical diagnosis and data available in the laboratory registers. Only confirmed cases, that is, seropositive by both Venereal Disease Research Laboratory (VDRL) (Institute of Serology, Kolkata) and *Treponema pallidum* particle agglutination (TPPA) (Serodia-TPPA, Fujirebio Inc., Tokyo, Japan) test were included in the study. The tests were performed as per the manufacturer's instructions. VDRL testing was also done in 10 cerebrospinal fluid (CSF) samples received from patients suspected of neurosyphilis. Trends of syphilis in different patient population were obtained by calculating the percentage positivity during each year. Data entry was done using Microsoft Excel 2010 software, and statistical analysis was done by applying the Chi-square test using SPSS version 17.0 (SPSS South Asia Pvt. Ltd., Bengaluru, India).

Table 1: Year-wise data of different study groups from 2006 to 2011

Subgroups	Year						Total
	2006	2007	2008	2009	2010	2011	
ANC							
n	1489	1208	1244	933	562	349	5785
Positive	3	6	8	5	3	3	28
Percentage	0.20	0.50	0.64	0.54	0.53	0.86	0.48
HIV							
n	880	1056	900	583	375	229	4023
Positive	25	22	20	22	19	16	124
Percentage	2.84	2.08	2.22	3.77	5.07	6.99	3.8
IVDU							
n	222	208	166	172	191	170	1129
Positive	3	1	3	0	0	3	10
Percentage	1.35	0.48	1.81	0.00	0.00	1.76	0.89
Neurosyphilis							
n	3	0	2	10	4	5	24
Positive	3	0	2	8	4	1	18
Percentage	100	0	100	80	100	20	75
STD							
n	220	88	169	165	178	195	1015
Positive	21	8	19	26	25	21	120
Percentage	9.55	9.09	11.24	15.76	14.04	10.77	11.7
Others							
n	2657	2385	3210	3285	2777	2630	16944
Positive	16	10	5	9	14	20	74
Percentage	0.60	0.42	0.16	0.27	0.50	0.76	0.44
Overall							
n	5471	4945	5691	5148	4087	3578	28920
Positive	71	47	57	70	65	64	374
Percentage	1.30	0.95	1.00	1.36	1.59	1.79	1.29
Males							
n	54	29	38	47	48	40	256
Females							
n	17	18	19	23	17	24	118

ANC=Antenatal cases; IVDU=Intravenous drug user; HIV=HIV seropositive individuals; STD=Sexually transmitted diseases clinic attendees

RESULTS

A total of 28,920 samples were received in the 6-year study period. Of these, 972 (3.36%) were sero-reactive by VDRL. Of the 1722 samples Submitted for TPPA, 374(21.7%) were found positive. The mean age of infected patients was 32.36 years (32.36 ± 13.27 years). More males (68.4%) were positive as compared to females (31.6%). About 24% (30 out of 124) patients with HIV presented with primary syphilis while the rest had secondary or latent syphilis. No case of symptomatic syphilis was found in pregnant women and IVDUs. In contrast to these patients, the major clinical presentation (60%, 72 patients) among STD clinic attendees was genital ulcer. Among the cases included in the other group, 19.8% (18 patients) had neurosyphilis, while the rest 18.2% (73 patients) had secondary syphilis. The detailed year-wise results for each group are provided in Table 1. The samples positive by both tests were considered as confirmed positive for syphilis and were analyzed to observe trends of syphilis in this population. On analyzing the mean seropositivity of patients in all groups together, it was found that there was an initial fall from 1.3% during 2006 to 0.95% during 2007, followed by an increasing secular trend during the successive years reaching its highest seroprevalence of 1.79% in 2011. This increase in the seroprevalence from 1% in 2008 to 1.79% during 2011 was statistically significant ($P = 0.001$, confidence interval [CI] =95%). Similarly, trend analysis of syphilis in HIV-positive individuals showed an initial fall from 2.84% in 2006 to 2.08% in 2007 followed by a sustained and statistically significant increase to 6.99% in 2011 (2006 vs. 2011, $P = 0.003$, CI = 95%). A rising trend of seroprevalence, though not statistically significant, was observed in pregnant women (2006 vs. 2011, $P = 0.054$, CI = 95%), IVDUs (2006 vs. 2011,

P = 0.741, CI = 95%), and patients from other wards/OPDs (2006 vs. 2011, P = 0.245, CI = 95%). Trend analysis of syphilis in STD clinic attendees revealed a fall from 9.5% in 2006 to 9.1% in 2007 (2006 vs. 2007, P = 0.015, CI = 95%), followed by a rise to 11.2% and 15.8% during 2008 and 2009 (2008 vs. 2009, P = 0.22, CI = 95%), again followed by a fall to reach 11.82% in 2011, which were not statistically significant (2006 vs. 2011, P = 0.741, CI = 95%).

DISCUSSION

A rise in the seroprevalence of syphilis has been observed in various studies in India and other countries.[1-3] Apart from several outbreaks, the diagnosis of infectious syphilis made at genitourinary medicine clinics in UK increased by 61% (from 1688 to 2713) in men over the decade 2003–2012.[2] Overall increases in rates among men (increasing from 8.1 cases in 2011 to 9.3 cases in 2012 per 100,000 population) was recorded in the USA.[1] In a study on STD clinic attendees in North India, there was a significant rise in the incidence of syphilis from 15.8% during 1990 to 24.2% 2004. This has been attributed to socio-economic factors, behavioral changes, and increasing prevalence of AIDS.[3,6] In the present study, we analyzed trends of syphilis in different groups of patients at our center. The total seroprevalence ranged from 0.95% to 1.79% over 6 years with the highest seroprevalence in 2011, showing a slow and gradual increase in seroprevalence over years. Only those patients positive by both VDRL and TPPA were analyzed to study the trends of syphilis. This was done to exclude biological false positive phenomenon observed with the VDRL test. The biological false positivity by VDRL test was observed to be 0.27%. The results are similar to another study, where Bala *et al*. looked for the usefulness of TPHA in the diagnosis of syphilis in weak reactive VDRL sera and reported a biological false positivity of 0.2%. They concluded that a confirmatory test such as TPHA should be performed on all sera with a reactive VDRL regardless of its titer.[7]

It was found that seroprevalence of syphilis among pregnant women was 0.8% during 2006–2011, which is less than that in Africa (2.13%), similar to the situation in the Americas (0.84%) and higher as compared to Europe (0.16%) and the Pacific (0.33%).[8] The highest seroprevalence was found in STD clinic attendees (11.7 ± 2.6), followed by HIV-positive individuals (3.8 ± 1.9), IVDUs (0.9 ± 0.8), patients from other wards/OPDs, and pregnant females (both 0.5 ± 0.2). A high seropositivity in STD clinic attendees has been reported in past by several authors and ranges from 2% to 29%.[3,9,10] However, a falling trend was observed at our center which could possibly be attributed to increased awareness in the public and an increased use of barrier contraceptives.

A rise in seroprevalence of syphilis was observed when all groups were analyzed together. Such findings have also been reported from the USA, Germany, and Sweden. In USA, the rise in the prevalence has been ascribed to increased number of men who have sex with men (MSM) and reduction in safe sex practices among them.[1,2] While in Europe, the rise is attributed to increased number of MSM as well as increased testing in high-risk groups. A rising trend of secondary syphilis has been reported in hospital-based studies from India in past by Kar and Ray *et al*.[3,11] This could be because of excessive reliance of the preventive programs on the syndromic management of genital ulcer. Kar proposed the need for a separate flow chart for the syndromic management of patients with secondary syphilis in his study. We could not, though, stratify our cases into primary, secondary, or tertiary syphilis because of lack of complete details of all patients. The rising trend at our center could also be because of increasing number of secondary syphilis, though this needs to be investigated further.

A statistically significant rise in seroprevalence of syphilis was observed in patients with HIV. While in Western countries, a cocktail of factors like persistent high-risk behavior and increased testing by HIV individuals has resulted in increased detection of syphilis, similar factors could be responsible for increased detection of cases at our center too. However, it was noteworthy to observe that the number of HIV-seropositive individuals tested at our center has reduced from 880 in 2006 to 229 in 2011. Hence, the increased prevalence in this group of individuals may not be attributable to increased testing but more likely due to continued high-risk behavior.

During the 6-year period of study, we received 24 serum samples from patients suspected of neurosyphilis, of which, 18 (75%) were seropositive by both VDRL and TPPA. Among the 24 patients, VDRL testing in CSF was done in 10 patients, of whom 7 (70%) were reactive. In a previous study from our center, a CSF VDRL was positive in 18 (72%) of 25 suspected cases of neurosyphilis.[12] Of these 24 patients, 7 had ocular neurosyphilis while the rest had meningovascular syphilis or syphilitic meningitis. Ocular syphilis is being

increasingly reported from India and other countries. Similar cases have been reported from India in past too.[13] This may be related to the post-AIDS/HAART era, with a growing pool of HIV-seropositive men who practice unsafe sex.

CONCLUSION

We observed a falling trend of syphilis in STD clinic attendees while a rising trend was observed in HIV-seropositive individuals, IVDUs, pregnant women, and patients from other wards and OPDs. The results may not reflect the true prevalence of syphilis in the community as this was a hospital-based study. Also, many patients with STDs approach private practitioners, and patients coming to our tertiary care center represent just the tip of this iceberg. Nevertheless, the observation of increasing trends in certain vulnerable subpopulation such as HIV patients, IVDUs, and pregnant females calls for continued and sustained efforts for case detection, treatment, and other preventive measures to contain the disease.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. CDC. Sexually Transmitted Disease Surveillance 2012. Atlanta: U.S. Department of Health and Human Services; 2013.
2. PHE. Recent Epidemiology of Infectious Syphilis and Congenital Syphilis Health Protection Report; 2013. p. 7.
3. Ray K, Bala M, Gupta SM, Khunger N, Puri P, Muralidhar S, *et al*. Changing trends in sexually transmitted infections at a Regional STD Centre in North India. Indian J Med Res 2006;124:559-68.
4. Desai VK, Kosambiya JK, Thakor HG, Umrigar DD, Khandwala BR, Bhuyan KK. Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India. Sex Transm Infect 2003;79:111-5.
5. Sethi S, Sharma K, Dhaliwal LK, Banga SS, Sharma M. Declining trends in syphilis prevalence among antenatal women in Northern India: A 10-year analysis from a tertiary healthcare centre. Sex Transm Infect 2007;83:592.
6. NACO Annual Report 2010-2011; 2012. p. 5.
7. Bala M, Toor A, Malhotra M, Kakran M, Muralidhar S, Ramesh V. Evaluation of the usefulness of *Treponema pallidum* hemagglutination test in the diagnosis of syphilis in weak reactive Venereal Disease Research Laboratory sera. Indian J Sex Transm Dis 2012;33:102-6.
8. Newman L, Kamb M, Hawkes S, Gomez G, Say L, Seuc A, *et al*. Global estimates of syphilis in pregnancy and associated adverse outcomes: Analysis of multinational antenatal surveillance data. PLoS Med 2013;10:e1001396.
9. Maity S, Bhunia SC, Biswas S, Saha MK. Syphilis seroprevalence among patients attending a sexually transmitted disease clinic in West Bengal, India. Jpn J Infect Dis 2011;64:506-8.
10. Thakur TS, Sharma V, Goyal A, Gupta ML. Seroprevalence of HIV antibodies, Australia antigen and VDRL reactivity in Himachal Pradesh. Indian J Med Sci1991;45:332-5.
11. Kar HK. Incidence of secondary syphilis on rise and need for a separate flow chart for its syndromic management. Indian J Sex Transm Dis 2004;25:22-5.
12. Sethi S, Das A, Kakkar N, Banga SS, Prabhakar S, Sharma M. Neurosyphilis in a tertiary care hospital in North India. Indian J Med Res 2005;122:249-53.
13. Chhablani JK, Biswas J, Sudharshan S. Panuveitis as a manifestation of ocular syphilis leading to HIV diagnosis. Oman J Ophthalmol 2010;3:29-31.